Chapter 4: Engineering Plan Format & Content

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Engineering and construction plans shall be prepared and organized include the following information:

1. General Sheet Information

A. All plan sheets must be ANSI D (22" x 34") bond paper. Oversized plan sheets will not be accepted.
B. The minimum font size shall be 0.08.
C. All drawings shall have the orientation of north, and lettering towards the top or to the right of the sheet.
D. All plan sheets shall be titled and numbered with the Title Sheet being sheet No. 1.
E. All sheets shall contain a horizontal and vertical graphical scale. Only engineering scales are permitted. Plans utilizing architectural scales will not be accepted and will be returned without being reviewed
F. Plan sheets shall be drawn and plotted using computer aided drafting (CAD)
G. North arrow
H. Phasing lines with description
I. Work limits shall be delineated
J. Distinct separation between proposed and existing elements of the plan

2. Title Sheet

This sheet identifies the project and provides information for the project location. The title sheet shall have the following information:

A. Project Name
B. Location map (scale 1-in = 1000-ft), locating the project in the City's vicinity
C. Site Index map (scale either 1-in = 100-ft or a maximum 1-in = 200-ft) showing:
D. General site layout
E. Centerlines and edges of pavement of all abutting streets
F. Street names
G. Municipal corporate boundaries
H. Site boundaries with bearings and distances
I. Identification of adjacent parcels, parcel number, property lines, and property owners
J. Proposed and existing rights-of-way, property lines
K. Project address
L. Standard drawing list indicating applicable municipality or state agency
M. Index of sheets
N. OUPS contact information
O. Benchmark list, referenced to NAVD 88
P. Signature, seal, date of signature, and registration number of the engineer of record.
Q. Plan release date
R. City of Delaware Signature Block, reference Standard Drawings
S. City of Delaware standard revision block, reference Standard Drawings
T. City of Delaware standard infrastructure ownership chart, reference Standard Drawings
U. Developer/Owner and design firm names, addresses, and telephone numbers
V. Current utilities ownership and contact information list

3. General Notes Sheet

The most current edition of City of Delaware standard notes for subdivision or commercial developments and special notes as required. These notes shall contain the Date of Issuance. No deletions or exceptions to the general notes shall be made. See the Engineering Standards, Part 3-Plan Notes.

4. Estimate of Quantities

Estimate of Quantities are to be presented in tabular form using the City of Columbus Item Number or specifying otherwise. All phases must be clearly broken out in the quantity table and on all plan sheets. This table could be included on the General Note Sheet or a separate sheet along with other details. Placing this table on the title sheet is strongly discouraged. These quantities must contain, at a minimum:

A. Lengths and sizes of all proposed utilities and their services
B. Type and Class of all utility conduits
C. Sidewalk and bike path within public right-of-way
D. All public and private roadway items.

5. Details Sheet

The following details need to be provided on this sheet if they deviate from the COD standard detail. This sheet may also be used for any additional pertinent detail drawings needed to adequately describe the construction process.

A. Entrance/approach details
B. Typical pavement sections
C. Show proposed curb
D. Sidewalk

6. Site Demolition Plan

This sheet shall be provided on an as-necessary basis to provide clarity for projects that will be removing existing buildings and structures. It may be combined with the Site Survey Plan at the discretion of the design engineer and with approval the Project Engineer.

7. Site Survey Plan

This sheet shall be provided for all easements and boundary information as well as existing structures. It shall be provided on an as-necessary basis at the discretion of the City.

8. Site Dimension Plan

The site dimension plans shall contain all information necessary for the establishment of the horizontal dimensions of the site including, but not limited to, the proposed building pad(s) location, pavement, setback, rights-of-way, property lines, easements, curb radii, sidewalks, and bike paths. Detailed site improvements such as on-site lighting, utility features, proposed landscaping, signs, grade spots and topographic contours must not be shown on the site dimension plan. This plan shall contain the following information with all appropriate elements clearly dimensioned and labeled:

A. Site layout, to scale, showing existing/proposed buildings, structures, roads

B. Driveway and parking areas
C. Proposed and Existing Storm Water and Sanitary lines and structures
D. Barricade locations
E. Sidewalks
F. Light and power poles
G. Waterways
H. Detention/retention basins
I. Tree/vegetation limits
J. Clearing limits, property lines, utility easements,
K. All property lines, labeled with metes and bounds of the property
L. Identify all contiguous property owners
M. Label property size, subdivision name, and lot number (as applicable)
N. Label current zoning of the property and intended use of all proposed buildings
O. Show and label any FEMA designated floodway, 100-year floodplain ,or OEPA required setback (as applicable)
P. Note any required vehicular access restrictions to public streets
Q. Show and dimension any required emergency vehicle access
R. Show the intersection visibility triangle at all adjacent street intersections (refer to ODOT standards)
S. Show and label all existing and proposed rights-of-way, easements (including type), and no-build zones
T. Show and label centerline, edge of pavement and/or back of curb, and right-of-way of all adjacent public or private streets. Dimension the total width of the street (note EP – EP or BC – BC) and right-of-way (proposed and existing)
U. Dimension all pavement and parking lot areas and note where the dimensions are taken from (e.g. edge of pavement, face of curb, or back of curb). This should include the pavement width, radius returns of curbs, parking spaces, and aisle width
V. Label size, location, and type of all proposed sidewalks or bike paths including all ramps to be built on site or within the public right of way
W. Label location and proposed size of all dumpster enclosures and pads
X. Show and label all required front, side, and rear yard setbacks, including all building and pavement setbacks
Y. Show and label all proposed and/or existing ingress/egress, access, or cross access easement aisles, drives, or driveways

9. Composite Utility Plan

These sheets shall contain all information of the underground and above-ground utilities, easements, rights-of-way, and pipe alignments, including, but not limited to, storm sewer, sanitary sewer, waterline, field tiles, roof drains, gas lines, electric lines, fiber optic lines, cable lines, and associated services. This plan shall contain the following minimum information.

A. All existing (dashed) and proposed (solid) utilities including all field tiles and drainage ditches.
B. Size and type (water, sanitary, etc.) of proposed and existing utility services, mains, and tees.

C. Invert at proposed building and end of service elevations of sanitary services in tabular form
D. Proposed pad and finished floor elevations
E. Location of all fire hydrants, meters, valves, and related service taps
F. Gas lines, Utility Poles (including pole ownership)
G. Property Lines, Easements, and Right-of-ways
H. Bearing and Distance of storm and/or sanitary main lines, measured from center of structure to center of structure, in tabular form as appropriate to plan set
I. Provide a Chart with State Plane Coordinates that includes blank columns for as-built information for storm structure, water structures (valves and Fire Hydrants only), and sanitary manholes.

10. Storm Sewer Profiles

The following information is required on all storm sewer profile sheets:

A. The storm profiles shall state the size, slope, pipe material and class of proposed pipe
B. Existing and proposed grade above the storm sewer
C. All proposed utility crossings
D. The 5-year hydraulic grade line shall be shown on the profiles.
E. The permanent pool and 5-yr ponding elevations must be shown at all end of run locations where the storm system empties into a retention basin.
F. Storm sewer top of casting and invert elevations
G. Structure and Headwall type labeled
H. All backfill types and limits, denoted with hatching. Influence lines and CGB limits are to be shown and stationed
I. Profiles are required for all public and private storm lines
J. Bedrock and groundwater table elevation (if known) shall be shown in all profiles.

11. Grading Plan

These sheets shall contain all information necessary for establishing grades and elevations on the site. Pipe alignments and critical elevations necessary for layout shall be displayed. The proposed grades shall be blended with adjacent property grading. This plan shall contain the following minimum information:

A. Existing contours. (1-ft intervals) Contours shall be extended 50-ft (minimum) beyond the project work limits to show adequate tie-in.
B. Proposed elevation including spot grades and/or contours
C. All existing (dashed) and proposed (solid) storm sewer and other utilities
D. Proposed pad and finished floor elevations of all proposed structures
E. Sanitary and storm sewer top of casting elevations
F. Grading limits
G. Roadway slopes and grades
H. Top of curb and back of walk grades at all lot-lines and grade breaks
I. Proposed landscape mounding contours
J. Major flood routing arrows
K. Major flood routing cross sections with 100-yr flow elevation

L. Rear yard ponding limits and elevation for the major storm
M. Street ponding limits and elevation for the 5-year design storm
N. Ditch centerline including direction of flow and slope
O. Cross-sections of ditches in right-of-way (at 50-foot intervals)
P. Driveway slope(s) from building lines to right-of-way lines
Q. A pre-grade (interim) plan may be required in subdivisions because the final grading of the individual lots will not be done with the initial infrastructure improvements. The development must be well drained when the Developer requests the API; therefore, it must be clearly shown how the area will drain in the interim conditions.
R. Open channels - typical cross sections shall be shown for all proposed open channel systems including, but not limited to, flood routing swales, roadside ditches, and minor storm conveyance channels. Typical cross sections shall show the appropriate dimensions and side slope values for each channel.

12. Basin Details Sheet

Dimensioned cross sections and plan views for each water quality BMP selected shall be shown. A table showing the required WQv and drawdown time as well as the designed storage and designed drawdown time of the basin shall be shown.

A. Ponding tabulations:
    1. Storage needed and provided for the 1- through 100-year return frequency events that were calculated in the stormwater management report.
    2. Elevation of water surface at each of the calculated storm events.
B. Orifice plate location and details
C. Spillway area details - emphasize critical spillway elevations such as top of bank, 100-yr ponding elevation, etc.
D. Outlet design details
E. Culverts: A profile for each roadway culvert shall be provided showing invert, roadway edge of pavement and/or top of curb, roadway centerline, and design storm and 100 year headwater and tail-water surface elevations. A table with each profile shall also be provided showing the Design and 100-year storm discharge values, head and tail water elevations and outlet velocities. Appropriate erosion control (i.e. rock channel protection type and size) must be shown.
F. Provide cut section through the pond. Cross sections of detention basins, wet or dry, shall be provided and dimensioned. Side slopes, basin bottom slope, the elevation of each inlet and outlet structure, and maximum water surface elevations for WQv storage, the critical storm, and the 100-year storm shall be annotated. An elevation view and plan view of each outlet riser structure shall be provided and annotated. Cross sections showing side slope, side slope information, bottom width dimensions, overflow weir elevations, bottom lining etc. shall also be shown.
G. For all basins provide the following information:
    1. 100-year Flood Pool Elevation
    2. Flood Limits
    3. Show pond contours - Max Side Slope 3:1 (4:1 Preferred)
    4. Emergency overflow location
H. Wet Basin, provide the following information:
    1. Normal Pool Elevation
    2. 8-feet wide safety shelf elevation 2-feet below normal pool

3. Pipe into pond may retain water to invert of first structure, however all submerged pipe must have watertight joints.
4. Depth to bottom of basin from normal pool is 8-feet minimum
5. 1-foot minimum freeboard from 100-year flood elevation to top of bank

13. Erosion & Sediment Control Plan

These sheets are to be submitted as part of the plan set as well as the SWP3. The site grading shall serve as the base information for the erosion and sediment control plan. Erosion and sedimentation controls shall meet the minimum requirements of the OEPA and the City of Delaware. The erosion control plan may be combined with the grading plan. The erosion and sediment control plan shall contain the following minimum information:

A. Inlet protection locations
B. Silt fence locations
C. Check dam locations
D. Construction entrance location
E. Staging area location
F. Fuel storage location
G. Concrete washout location
H. Material and debris storage location
I. Stream crossing locations
J. Location and prevention measures take for any other construction activities that may impact stormwater runoff
K. Temporary sediment settling basin locations

14. Erosion & Sediment Control Details Sheet

These sheets shall contain the following minimum information:

A. To be submitted as part of both the plan set and the SWP3
B. Standard erosion control notes including a sequence of construction
C. Erosion control standard details
D. Stream crossing details
E. Sediment basin and temporary outlet structure details

15. Sanitary Sewer Plan

This plan shall contain all information of the proposed sanitary sewer, services, and easements. The sanitary plan may be submitted as a separate submission, however, it must contain all elements of a plan set, including but not limited to, a title sheet, a complete set of general notes, quantities, detail drawings, etc. This plan shall contain the following minimum information:

A. All existing (dashed) and proposed (solid) sanitary sewer and other utilities showing size, length, and type
B. Sanitary sewer services, including station, size, riser height, extension length, slope, and elevation at end of service in tabular form
C. All easements, ROW, edge or pavement, and building lines
D. Proposed pad and finished floor elevations of all proposed structures
E. Property lines, rights-of-way, and easements

F. A tributary map shall be included either as a separate sheet or on the title sheet as part of the index map (title sheet) depending on the size of the project.
G. Provide a Chart with State Plane Coordinates that includes blank columns for as-built information for all sanitary manholes.
H. Provide stationing, bearings, and distances (center of structure to center of structure) for all sanitary main lines.

16. Sanitary Sewer Profiles

These sheets shall contain the following minimum information:

A. All tie-in point elevations shall be field verified
B. Sanitary sewer profile indicating size, slope, and type of proposed sanitary sewer
C. Existing and proposed grade above the sanitary sewer
D. All proposed utility crossings
E. Sanitary sewer top of casting and invert elevations
F. Locations of clay trench dams
G. All backfill and lines of influence shall be shown and labeled with type and station. Areas backfilled with CGB shall be hatched or shaded.
H. Bedrock and groundwater table elevation (if known) shall be shown in all profiles.

17. Roadway Improvement Plan and Profile Sheets (Including Waterline Details)

This plan shall include all information necessary for the construction of the proposed roadway improvements within existing or proposed right-of-way or easements. This plan shall contain the following minimum information:

A. Typical sections for all roadways that deviate from COD standard drawings
B. The design speed and the posted speed for all roadways, public and private.
C. Existing topographic features within development area
D. Right-of-way and property lines information and neighboring property ownership
E. Existing utility location of all known utilities, public and private
F. Centerline stationing of proposed road
G. Centerline bearing
H. Horizontal curve data for proposed road
I. Profile showing profile grade elevation and existing ground
J. Vertical curve information
K. All utility crossings
L. Location, size, and type of any storm structure located in the ROW
M. The public water main shall be shown on the street plan and profile sheet
N. Locate all service taps, fire hydrants, and valves on both the plan and profile
O. All backfill and lines of influence shall be shown and labeled with type and station. Areas backfilled with CGB shall be hatched or shaded
P. Superelevation tables

18. Intersection Detail Sheets

These sheets shall contain the following minimum information:

A. Intersection details that include curb return radii, intersection grading, curve data n

B. Centerline bearing
C. Centerline and gutter line (edge of pavement) slopes
D. Angle between intersecting centerlines
E. Proposed locations, spot elevations and slopes for all handicap ramps. The ramps shall comply with all ADA standards.

19. Roadway Cross-Sections

Roadway cross-sections are required at 50-ft intervals (minimum) when a ditch section is used or a ditch exists beyond the back of curb.
This plan shall contain the following minimum information:

A. Roadway cross-sections, showing existing and proposed utilities and right-of-way limits.
B. Right-of-Way lines and easements
C. Roadway center line and elevation
D. Existing and proposed cut and fill sections
E. Ditch side slopes
F. Grade tie-in points
G. Longitudinal ditch slope

20. Maintenance of Traffic Plan

This plan shall contain the following minimum information:

A. Traffic control and maintenance information during construction including all temporary signage, signals, pavement markings, barrel and barricade locations, etc.
B. MOT phasing
C. MOT Details and references to ODOT standard drawings
D. Cut-sections showing lane widths

21. Signage and Striping Plan

This plan shall contain the following minimum information:

A. General street layout showing all existing and proposed signage and striping
B. Street centerline and stationing
C. Signage and striping station and offset
D. Signage and Striping details and notes

22. Landscaping Plan

This plan shall contain the following minimum information:

A. Mounding
B. Tree planting location and type
C. Planting Notes
D. Retail sign locations (monument signs only not building signs)

23. Lighting & Fiber Optic Line Plan

The following lighting related items, including but not limited to the isolux diagram, all light fixtures, pole heights, on building fixtures and lighting timing, shall be submitted to

the Planning Department for review and approval. The signed and approved isolux diagram and lighting submission shall be included in the final engineering set.

This plan shall contain the following minimum information:

A. Show isolux diagram
B. General site layout
C. Light pole locations (station and offset)
D. Lighting Notes
E. Street lighting control circuit diagram
F. Lighting distribution diagram
G. Lighting details
H. Fiber optic line and pull box location per project design requirements